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RHEUMATISM; ITS PATHOLOGY AND MODERN TREATMENT.

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Rheumatism; Its Pathology and Modern Treatment.

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OWING to the lack of definite etiological and anatomical basis for the classification of rheumatism as a disease, its study, as yet, is one largely of symptomatology.

Scudamore holds that rheumatism is a disease external to the system which itself becomes affected in a secondary manner by sympathy, but in turn reflects back its influence upon the external parts. He says we may view the effect in the light of a common inflammation modified by the exciting cause (cold) and by the influence of the particular textures affected.

Another theory is that the symptoms of rheumatism are set in motion by the abstraction of heat, which produces contraction of the superficial vessels succeeded by dilatation and afflux of blood of the parts, dilation being maintained long enough to result in inflammation. But the capillaries are non-muscular and the regulation of their blood supply is by nerve action.

Dr. J. K. Mitchell believes that rheumatism has its origin in the medullas pinalis and depends upon irritation of the organ.

Prout first suggested that the absorption of lactic acid was the cause of derangement of the secondary assimilating powers and produce rheumatism, catarrh and ague, according to exposure to various influences combined with diatheses. This is also supported by Richardson, Todd and Haig. A later view of the same theory promulgated by Senator is that the acid is developed in the muscles of activity, and that a chill causes a retention of this acid with other effects material, the which produces rheumatism. While lactic acid is found in excess in the blood in this disease, Dr. MacLangan holds that this excess is the result of increased metamorphosis of

glucose (the non-nitrogenous tissue element of the motor apparatus) as a product of the effect of rheumatic poison on the fibrous textures of the joints. He holds the miasmatic theory of rheumatism and believes the disease to be almost analagous to malaria. He charges the bacillus malaria with the crime of generating both ague and rheumatism. Bertolon and Pell regard a distinct connection between rheumatism and malaria, the latter stating that in Amsterdam in the years when malaria is prevalent there is little rheumatism and vice versa.

Still another view is that rheumatism arises from a profound disturbance of the heat-regulating apparatus which especially effects the muscular system, causing the heat to be generated without work; one of the consequences being that impressions of pain are conveyed to the brain by the articular nerves instead of by work performed. There must be retention of heat to account for rise of temperature, but it is not the heat of work done.

A careful study of the theories just mentioned as to the cause of the group of phenomena called rheumatism will determine that each has some element of truth, supported by experimentation and clinical observation.

The belief that rheumatism is an infectious disease produced by bacterial is the true one, and is rapidly gaining credence. Rheumatism is intimately related to other infectious diseases, especially malaria, endocarditis, meningitis and chorea, and often eventuates in neuroses. It frequently occurs in epidemics, as reported by Eichorst from the Hospital at Zurich, and by Pell of Amsterdam, who cites a case of a patient that was removed to a bed between two others suffering from rheumatic fever. She never having had rheumatism, was attacked with it, coincidently with a relapse of this disease in five other patients.

Similar cases are mentioned by Schafer, Salisbury and Thorensen, the latter having observed the spread of the disease by personal contact as Sawyer observed malaria.

Edelfen states that in Kiel it is a house disease like fibronous pneumonia and typhoid fever. He reports 728 cases occurring in 492 houses. Muller has shown that the disease does not occur within a few hours after exposure, but that it has a *prodromal* period, as in other infectious diseases, and that often the fever precedes by days, the articular and other symptoms.

The schizomycete or bacterium which produces rheumatism is taken into the blood where its action or presence is responsible for the rapid diminution of the red corpuscles by robbing them of their oxygen and the greater increase of the white blood corpuscles, also for the increase of the fibrin from three to seven or eight parts to 1,000. The infectious organism seeks the white fibrinous tissue, and the serous tissue of the motor apparatus, because here it finds the best medium for growth and development. The schizomycete acts as a local irritant wherever it lodges. It alters the constituents of the blood stream, which it fills with more of its kind. The parts inflamed form favorable media for the rapid multiplication of the schizomycete, and the contaminated blood carries them along to produce results elsewhere. I believe all the phenomena of this disease and its sequelæ are the result of the morbid state of the blood, produced by the presence of the offending schizomycete and its products. I am persuaded that two or

more deleterious schizomycete may exist at the same time in the system as in cases of phthisis where intercurrent attacks of rheumatism occur, or where we have pneumonia in a patient with anthrax. While there are millions of microbes in food, the water and air, and in the blood, and while the blood itself has power to diminish or even destroy, by the million, various bacilli in a few hours, even the typhoid bacillus as shown by Fedor; while the streptococcus pyogenes of Rosenbach is harmless in healthy saliva so long as the epithelium is intact, *each of these same bacteria may produce death.*

Careful post-mortem examinations have failed to find altogether adequate lesions explaining the morbid symptoms of rheumatism. Hemorrhages have been found in the mediastinum, endocardium, pericardium spleen, pleura, in the meninges and peritoneum. Also cloudy swelling of the kidneys, liver and heart with injection of synovial membranes and erosion of cartilages with many morbid states, positive proof of an infectious process.

The exact schizomycete of rheumatism has not yet been found, but proofs are sufficient to warrant thorough experimental research, to isolate, to cultivate, inoculate and demonstrate the constant presence and the positive identity of the micro-organism of rheumatism.

However much we disagree in theory, we may all agree as to the clinical history of rheumatism, viz., that it is a disease of youth, especially between the ages of 15 and 30 years; that those exposed to the weather and bad air, and who are poorly nourished are especially liable to suffer from this disease; that it is prevalent in warm and temperate climates, and near the sea coast; that there is greater liability, other things being equal, of its recurrence in those who have once been afflicted.

An attack is usually ushered in by a chill or rigor, followed by feverishness, stiffness or pain (which soon becomes intense) in one or more red, swollen, tender joints. This is accompanied by perspiration and prostration. The patient is helpless and restless. The face is flushed, the pupils dilated; the whole body is hot and bathed in sour-smelling perspiration. The temperature is 100 degrees to 105 degrees F., the pulse rapid, full and soft. The tongue is covered with yellow fur; there is thirst, anorexia and constipation. The urine is diminished, dark red, and of high specific gravity, highly acid and often contains albumen. The inflammation, with all its accompaniments, migrates from joint to joint, from sheath to tendon, synovial membrane to periosteum, from endocardium to neurilemma, always announcing its arrival by some or all the phenomena known of that condition. The duration is from a few days to weeks or years. The results are: Joints stiff or anchylosed, or nodulated changes in sheath, tendons, ligaments, periosteum, endocardium, pericardium, valves and heart-muscles, synovial membrane and neurilemma, with a medley of morbid conditions, such as hematuria, paraplegia, paralysis of the bladder (from implication of the spinal cord), hemiplegia, monoplegia from cerebral diseases, chorea, melancholia, insanity and imbecility.

Few diseases have had so many recommended remedies and vaunted specifics for their alleviation as rheumatism. Nevertheless, there are

certain well-recognized principles of treatment directly applicable in this disease. The treatment differs in the acute and chronic forms of the disease only in degree, duration and detail.

We must alleviate pain, reduce temperature, open the emunctories of the system, rid it of the *materies morbi* that it contains as partly the cause, partly the result of the systemic disturbance. The patient's room should be large, well aired, and one where the sunshine is a daily visitor. The air should be at an even temperature of 75 degrees F. Two beds should be used, one during the day and the other during the night. No linen should touch the skin, and the patient should wear woolen under-garments, night and day, during and always subsequent to an attack—a light-weight for summer, and medium for winter. I am certain that people wear too heavy undergarments in winter and too thin in summer. Absolute rest of mind, body and eyes should be enjoined.

Affected joints should be enveloped in wool kept in position by a light bandage. If not greatly swollen a plaster-of-Paris bandage should be applied, the limb elevated and the joint immobilized. Opiate lotions, evaporation being prevented by oil-skin, are to be used when the capsular ligament of the joint resists expansion and the plaster bandage is not used. Blistering, bleeding, leeching and cupping, as practiced by Sydenham, are replaced by general remedies indicated, combined with antiseptics, alterative, laxatives, diuretics and tonics. The diet should consist of liquid food, custards, lemonade, citrate of potassium in solution, and other acids and cooling drinks, along with an abundance of water, effervescing waters, koumyss, matzoon and milk. In extreme hyperpyrexia, uncontrolled by moderate doses of drugs, the cold bath, in which the water is cooled rapidly but gradually down from 94 degrees F. to 68 degrees F. should be used, its effects being watched carefully. The warm bath should be used daily for 20 minutes with massage while in the water. Alma-Bromo Water has been most effective in my hands for the past two years. Turkish, hot air, vapor and Russian baths with manipulation, aid greatly in elimination. Galvanism and Faradism, in the hands of those who understand their use, relieve pain and help to prevent muscular weakness, atrophy and deformity.

Without discussing the chemical reaction and the therapeutic rationale of modern remedies used, we desire to note the clinical results, so near as ascertainable, of a few of the more valuable drugs used in the treatment of this disease.

Antipyrin, according to See, Guttman, and Stezeninski, in doses of from four to six grains per day, and continued for a week or ten days, produces beneficial and satisfactory results. This I would not dare to use where there is heart weakness or valvular lesion. They hold that it is found efficacious where antifebrin and the compounds of salicylic acid have apparently failed. Its uses, they say, reduces temperature, alleviates pain, and prevents implication of the cardiac membranes, without producing any of the unpleasant effects caused by salicylates.

The beneficial results obtained by the drugs in these cases are stated to be 41.8 per cent. Fowler's solution in 5 drop doses, gradually increased, according to tolerance, and then reduced to one-half of the last dose given,

and continued for several weeks or months, as in chorea, seems to have produced excellent results in mild non-febrile cases. Cascara sagrada has been extolled by Dr. Goodwin and others, giving in 15 to 20 minim doses every four hours. No attempt has been successful in explaining its action, but the results are probably due to the laxative effects helping elimination, Salicin and the salicylate compound being among the most powerful antiseptics known, I believe, on this account, to be the sovereign remedies in the treatment of rheumatism. These should be used alone with laxatives, alteratives, eliminants, stomachics, tonics and proper attention to the general rational indications. To Maclagan, Stricker and Riess we owe credit for bringing this remedy to the notice of the profession. Salicin produces many similar effects to those of quinia.

In an acute case the treatment with salicylic acid or salicin should be commenced by giving 20 grains of the drug in elixir or lemonade every two hours for the first 12 hours, or until tinnitus aurium is produced. The same dose is to be continued every three hours for the next 12 hours, and thereafter for four or five days the same amount is to be given every four hours. The regulation of the amount given is to be determined by the physiological effect and abatement of the symptoms, i. e., the reduction of the temperature, the relief of pain, and the depression of the heart's action. The most frequent cause of failure in the use of this remedy is in not giving a sufficient quantity at each dose, or not repeating the amount frequently enough. Whenever the symptoms begin to subside the amount of frequency, or both, should be diminished to the point of saturation, but the remedy should be administered for at least six weeks in every case, aided by constant elimination and repair. I have found good results within the first 48 hours, and the more acute the case the more effective the results of the remedy. In treating over 200 cases I have not found any who have not obtained benefit, and 60 per cent of the primary acute cases have been entirely relieved. The more chronic the case the longer treatment should continue.

I believe the heart and brain complications sustain the same relation to the schizomycete, or the blood changes produced by its presence, along with a local inflammation, as does the joint affection. I have not often noted heart or brain mischief where the salicyl treatment has been used from the beginning and there was no previous heart lesion; usually later on, in cases where the salicin has not been used until inflammation has already occurred in the cardiac membranes upon which the salicin preparations have no direct effect.

To cure the rheumatism is not to cure the heart lesion, for the effect may remain after the cause is removed. The appropriate treatment of the rheumatism at its inception ought to prevent the heart from becoming affected. After it is once affected, however, relief is obtained only in the same way as if the inflammation had arisen from other causes. The same is true of inflammation of the dura mater. I speak of these because I believe the only immediate or remote danger to life in cases of rheumatism to be in the implication of these organs.

After the more acute symptoms have subsided, quinia, cod-liver oil, iron, Fowler's solution, and the iodides in small doses should be adminis-

tered for weeks, and even months, as the inflamed textures do not recover their tonicity so soon as the inflammation ceases. The administration of the salicyl compounds arrest the course of the disease chiefly by their antiseptic and antimicrobic action, destroying or rendering inert the schizomycete concerned in its production. They also have a diuretic effect. They reduce the temperature by removing the cause of the inflammation by which the temperature is produced, and thus relieve tension and pain simultaneously. They thus arrest and shorten the course of the disease by removing its cause.

By the elimination of the *materies morbi* through the emunctories of the body, accomplished by the use of hydro-therapeutics and our ordinary remedies, we have the system again restored to its normal state, save the effect of the attack upon it of the specific schizomycete which has produced the malady, and the possible retention of some of the microbes for future ravages whenever the condition of the system becomes favorable for their multiplication and renewed activity.